

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
III B. Tech I Semester Regular/Supplementary Examinations, April/May -2025
MACHINE LEARNING

((Common to CSE(AI ML), CSE(AI), CSE(DS), CSE(AIDS), AI DS, AI ML)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I			
1.	a)	What is Machine Learning? How is it different from traditional programming approaches?	[7M]
	b)	Briefly explain the main challenges in Machine Learning.	[7M]
(OR)			
2.	a)	Differentiate between Supervised and Unsupervised Learning. Would you frame spam detection as supervised or unsupervised problem? Explain Why.	
	b)	What is the use of the train, validation, and test sets? If your model performs great on the training data but generalizes poorly to new instances, what is happening?	[7M]
UNIT-II			
3.	a)	Write the assumptions made in simple linear regression. Explain the properties of least-square estimators.	[7M]
	b)	What is the fundamental idea behind Support Vector Machines?	[7M]
(OR)			
4.	a)	What are distance based methods in machine learning? Explain any one algorithm that uses distance based method.	[7M]
	b)	Explain entropy in the context of Decision Trees.	[7M]
UNIT-III			
5.	a)	What is the difference between hard and soft voting classifiers? When is each type preferred in ensemble learning?	[7M]
	b)	Discuss the concept of boosting in ensemble learning. How does it differ from bagging, and what are some popular boosting algorithms?	[7M]
(OR)			
6.	a)	Discuss the advantages and limitations of Naïve Bayes classifiers in comparison with SVMs and ensemble methods.	[7M]
	b)	What is a Random Forest? Explain its working principle and advantages over a single decision tree.	[7M]
UNIT-IV			
7.	a)	Define clustering. Explain K-means clustering with algorithm and flowchart.	[7M]
	b)	Explain the DBSCAN algorithm for density based clustering. List out its advantages compared to K-means	[7M]
(OR)			
8.	a)	What are the main motivations for reducing a dataset's	[7M]

		dimensionality? What are the main drawbacks?	
	b)	What is the curse of dimensionality? Explain any dimensionality reduction technique.	[7M]
		<u>UNIT-V</u>	
9.	a)	Explain the architecture and working of Artificial Neural Networks (ANNs). How do they mimic biological neural networks, and what are their key components?	[7M]
	b)	Describe the process of implementing a Multilayer Perceptron (MLP) using Keras. What are the main layers used, and how does the training process work in Keras?	[7M]
		(OR)	
10.	a)	What are the various methods available in TensorFlow for loading and preprocessing data? Provide examples of how datasets can be prepared for training a deep learning model.	[7M]
	b)	Explain the process of training, validating, and testing an ANN model using Keras. What are callbacks and how do they assist in training deep learning models?	[7M]
